

Assessing Riparian Shade for the Lemhi River, Idaho Using LiDAR: A Point Cloud Analysis

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Riparian vegetation plays a crucial role in shading streams by reducing the amount of incoming solar insolation that would otherwise reach the water surface, negatively affecting water temperature and photosynthetic organisms within the water column. Unlike incoming solar insolation, riparian shade can be manipulated by adding or removing riparian vegetation, making it attractive for restoration as well as thermal credit trading programs. Before riparian shade can be evaluated in such trading programs, the existing riparian vegetation needs to be quantified. Several studies have investigated the utility of LiDAR derived canopy height models for estimating riparian shade, however, few to no studies have used point cloud data as a direct model input in order to improve the riparian shade estimates. Using point cloud data increases spatial resolution and the ability to extract vegetation shape information without losses due to interpolation/rasterization. In this study, we assessed the ability of LiDAR point cloud data to estimate riparian shade for 32 km of the Lemhi River in north central Idaho. Riparian shade quantification of the point cloud and canopy height models are compared to shade values calculated using established models in practice.